MARYLAND DEPARTMENT OF THE ENVIRONMENT
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William Donald Schaefer
Governor

Robert Perciasepe
Secretary

MEMORANDUM

TO: David A. C. Carroll, Chairman
Principal Staff Committee
Principal Staff Committee Members

FROM: Robert Perciasepe, Chairman
Reevaluation Workgroup

THROUGH: William Matuszeski, Chairman
Implementation Committee

DATE:

SUBJECT: Nutrient Reevaluation Load Allocations

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The Nutrient Reevaluation Workgroup met on September 30, 1992 to recommend the allocations of nitrogen and phosphorus needed to meet the 40% nutrient reduction goal. These allocations will serve as the basis for the tributary strategies that will be prepared by August, 1993. These final recommendations of the Reevaluation are being submitted by me on behalf of the Workgroup for your approval.

The total watershed load reductions recommended by the Workgroup will reduce 1985 point source and 1984-1987 average nonpoint source loadings of nitrogen by 74.1 million pounds and phosphorus by 8.44 million pounds annually. These load reductions are projected by the Bay model to reduce the extent and duration of low oxygen waters in the mainstem by at least 20 percent. Any additional load reductions from the Clean Air Act Amendments or from non-signatory states would result in further improvements in the Bay.

This allocation represents a 40% reduction in controllable point and nonpoint source loads on a basin-wide basis which comprise the three major geographic regions used in the modeling process. The geographic regions (Geo 1, 2 and 3) contain the following 10 basins:

Geo 1:	Susquehanna
Geo 2:	Upper W. Shore MD; Patuxent; Potomac; E. Shore MD
Geo 3:	Rappahannock; York; James; W. Shore VA; E. Shore VA

This same 40% reduction in controllable loads from the signatory jurisdictions, applied to each of the 10 Reevaluation basins, was

agreed to as a starting point for development of the tributary strategies. Provisional target loadings to the major tributaries are attached. Load reduction targets (in millions of pounds per year) for the three geographic regions and for the four jurisdictions are summarized below:

Region	N Load Reduction	P Load Reduction
Geo 1	18.3	2.22
Geo 2	35.5	3.20
Geo 3	20.3	3.02
Bay Total	74.1	8.44

Jurisdiction	N Load Reduction	P Load Reduction
Pennsylvania	19.8	2.46
Maryland	22.7	2.11
Virginia	28.1	3.82
D. C.	3.5	0.05
Bay Total	74.1	8.44

It is understood that states may choose, as well, to develop tributary plans for portions of the basins.

The Reevaluation Workgroup adopted the nutrient allocation goals with the following guidance:

1. The allocation to the Susquehanna River Basin (Geo 1) may, in the future, be adjusted based upon revised estimates from the Watershed Model.

2. If changes are made in the Geo 1 allocation, the difference would be shifted to the Geo 2 region, keeping the total Geo 1 plus Geo 2 nutrient load reduction constant.

3. Some interstate trading of allocation responsibilities could occur in the Potomac River Basin during the preparation of tributary strategies.

4. Some intrastate trading of allocation responsibilities may occur during the preparation of tributary strategies.

The Workgroup further acknowledged that the allocations for Virginia tributaries (the James, York, Rappahannock, Eastern and Western Shore Virginia) are interim and may change once the living resource needs of each of those tributaries are better understood.

Based on agreements and discussions at the Executive Council

meeting this past August, it is my understanding that the nutrient loads remaining after the 40% load reduction targets are met will be maintained beyond the year 2000. Furthermore, reductions from atmospheric sources and non-signatory jurisdictions will be over and above the reductions agreed to by the Bay Agreement jurisdictions.

The next step in the Bay's nutrient reduction strategy will be for the Bay Agreement jurisdictions to prepare their tributary-specific strategies by August of 1993. Two workgroups of the Implementation Committee have recently been formed to guide "common elements" of the tributary strategies and public participation.

Finally, to assist in the development of tributary strategies and to document our work in the Reevaluation, I have asked the Reevaluation participants responsible for the following reports to complete them by the end of this year:

- Nonpoint Source Load Inventory
- Point Source Load Inventory
- Water Quality Characterization
- Living Resources Characterization
- Technology Effectiveness for Point and Nonpoint Sources
- Summary of Modeling Activities

In closing, I would like to thank all of the PSC members for their support during this difficult and time consuming process. We have come a long way since 1987 and the work we have all done places us on a much firmer foundation to press for the difficult decisions that are necessary to meet the required reductions of nutrients entering the Bay.

RP/cjk

Attachments

Table 1a. Total Nitrogen Loading to Chesapeake Bay by Major Tributary - 1985 Base Load and Year 2000 Allocation (in millions lbs/yr)

AUG 13, 1993 River Basin	Nutrient Source[1]	1985 Base Load[2]	Reduction 40% Controllable	1992 Progress Run[4]	Limit of Technology	Projected Year 2000[4]	Tributary Nutrient Load Allocation[3]
Susquehanna (PA & MD Only)	Nonpoint	106.5	14.2	105.6	91.6	105.7	
	Point	10.3	4.1	11.4	2.2	14.2	
	SUBTOTAL	116.8	18.3	117.0	93.8	119.9	98.5
Patuxent	Nonpoint	3.4	0.8	3.1	2.5	3.4	
	Point	1.5	0.6	1.2	0.3	2.3	
	SUBTOTAL	4.9	1.4	4.3	2.8	5.7	3.5
Potomac (PA, MD,DC, & VA Only)	Nonpoint	42.6	8.3	40.5	32.8	42.1	
	Point	26.1	10.4	27.2	4.7	35.9	
	SUBTOTAL	68.7	18.7	67.6	37.5	78.0	50.0
Rappahannock	Nonpoint	7.9	2.4	7.5	6.0	7.5	
	Point	0.5	0.2	0.6	0.1	0.6	
	SUBTOTAL	8.3	2.6	8.1	6.1	8.1	5.7
York	Nonpoint	5.1	1.4	4.8	3.9	5.1	
	Point	1.3	0.5	1.4	0.2	1.8	
	SUBTOTAL	6.4	1.9	6.1	4.1	6.9	4.5
James (VA Only)	Nonpoint	21.1	5.1	20.7	18.3	21.1	
	Point	22.6	9.0	19.0	2.9	31.4	
	SUBTOTAL	43.7	14.1	39.7	21.2	52.5	29.6
Western Shore Maryland	Nonpoint	6.6	1.8	6.2	4.8	6.7	
	Point	19.9	8.0	11.7	3.4	27.7	
	SUBTOTAL	26.5	9.7	17.9	8.2	34.4	16.8
Eastern Shore Maryland (MD Only)	Nonpoint	21.7	5.2	20.0	15.6	21.4	
	Point	1.1	0.4	1.5	0.2	1.5	
	SUBTOTAL	22.8	5.6	21.5	15.8	22.9	17.2
Western Shore Virginia	Nonpoint	3.2	0.8	3.1	2.6	3.5	
	Point	1.0	0.4	1.0	0.1	1.4	
	SUBTOTAL	4.2	1.2	4.2	2.7	4.9	3.0
Eastern Shore Virginia	Nonpoint	1.5	0.3	1.4	1.2	1.5	
	Point	0.3	0.1	0.2	0.05	0.4	
	SUBTOTAL	1.8	0.4	1.7	1.2	1.9	1.4
Bay Agreement States Total	Nonpoint	219.5	40.3	213.0	179.3	217.9	
	Point	84.5	33.8	75.2	14.1	117.3	
	TOTAL	304.0	74.1	288.2	193.4	335.2	229.9

Source: Phase II Watershed Model.

1. Nonpoint source loads include atmospheric deposition to the land. Point source loads are reported as delivered to tidal waters.
2. 1985 Base Load is 1984-87 averaged output from the Watershed Model plus point source load discharged below fall line.
3. Allocations recommended by the Reevaluation Workgroup on September 30, 1992.
4. Non-Bay Program state loads for 1991 Progress and Year 2000 are not tracked as completely as for Bay Program states.

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Table 1b. Total Phosphorus Loading to Chesapeake Bay by Major Tributary - 1985 Base Load and Year 2000 Allocation (in millions lbs/yr)

Sept. 30, 1992 River Basin	Nutrient Source[2]	1985 Base Load[3]	Forest Background Load[4]	Controllable Load[5]	Reduction (40% Controllable)	Tributary Nutrient Load Allocation[1]	Y Axis
Susquehanna (PA & MD Only)	Nonpoint	4.42	0.40	4.02	1.61		1
	Point	1.53	0.00	1.53	0.61		2
	SUBTOTAL	5.95	0.40	5.55	2.22	3.73	3
Patuxent	Nonpoint	0.29	0.03	0.26	0.10		4
	Point	0.24	0.00	0.24	0.10		5
	SUBTOTAL	0.53	0.03	0.50	0.20	0.33	6
Potomac (PA, MD,DC, & VA Only)	Nonpoint	4.12	1.05	3.07	1.23		7
	Point	1.20	0.00	1.20	0.48		8
	SUBTOTAL	5.32	1.05	4.27	1.71	3.61	9
Rappahannock	Nonpoint	0.69	0.06	0.63	0.25		10
	Point	0.17	0.00	0.17	0.07		11
	SUBTOTAL	0.86	0.06	0.80	0.32	0.54	12
York	Nonpoint	0.51	0.07	0.44	0.18		13
	Point	0.42	0.00	0.42	0.17		14
	SUBTOTAL	0.93	0.07	0.86	0.34	0.59	15
James (VA Only)	Nonpoint	2.53	0.84	1.69	0.68		16
	Point	3.65	0.00	3.65	1.46		17
	SUBTOTAL	6.18	0.84	5.34	2.14	4.04	18
Western Shore Maryland	Nonpoint	0.53	0.03	0.50	0.20		19
	Point	1.17	0.00	1.17	0.47		20
	SUBTOTAL	1.70	0.03	1.67	0.67	1.03	21
Eastern Shore Maryland (MD Only)	Nonpoint	1.56	0.26	1.30	0.52		22
	Point	0.24	0.00	0.24	0.10		23
	SUBTOTAL	1.81	0.26	1.55	0.62	1.19	24
Western Shore Virginia	Nonpoint	0.21	0.03	0.18	0.07		25
	Point	0.29	0.00	0.29	0.12		26
	SUBTOTAL	0.50	0.03	0.47	0.19	0.31	27
Eastern Shore Virginia	Nonpoint	0.083	0.01	0.073	0.03		28
	Point	0.006	0.00	0.006	0.00		29
	SUBTOTAL	0.089	0.01	0.079	0.03	0.059	30
Bay Agreement States Total	Nonpoint	14.94	2.79	12.15	4.86		31
	Point	8.92	0.00	8.92	3.57		32
	TOTAL	23.87	2.79	21.08	8.43	15.44	33
X Axis		A	B	C	D	E	

Source: 1991 Watershed Model.

1. Allocations recommended by the Reevaluation Workgroup on September 30, 1992.
2. Nonpoint source loads include atmospheric deposition to the land. Point source loads are reported as delivered to tidal waters.
3. 1985 Base Load is 1984-87 averaged output from the Watershed Model plus point source load discharged below fall line.
4. Forest Background Load simulated all land uses converted to forest. (See Technical Appendix Simulation Forest Reference No. 1 and 2A) Includes atmospheric deposition on the land, rivers and lakes that are not assumed to be controlled through Tier I controls under the Clean Air Act.
5. Controllable Load is Base Load minus Forest Background Load.
6. Atmospheric deposition to tidal waters, 1.47 million pounds of phosphorus per year, is not shown on this table. None of this loading will be reduced through Tier I controls under the Clean Air Act.

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Table 2a. Nitrogen Loading to Chesapeake Bay by Jurisdiction - 1985 Base Load and Year 2000 Allocation (in millions lbs/yr)

Sept. 30, 1992 Jurisdiction	Nutrient Source[2]	1985 Base Load[3]	Forest Background Load[4]	Controllable Load[5]	Reduction (40% Controllable)	Tributary Nutrient Load Allocation[1]	Y Axis
Pennsylvania	Nonpoint	114.1	75.3	38.8	15.5		1
	Point	10.7	0.0	10.7	4.3		2
	SUBTOTAL	124.8	75.3	49.5	19.8	105.0	3
Maryland	Nonpoint	45.5	19.6	25.9	10.4		4
	Point	30.9	0.0	30.9	12.4		5
	SUBTOTAL	76.4	19.6	56.8	22.8	53.6	6
Virginia	Nonpoint	59.7	23.8	35.9	14.4		7
	Point	34.3	0.0	34.3	13.7		8
	SUBTOTAL	94.0	23.8	70.2	28.1	65.9	9
District of	Nonpoint	0.3	0.1	0.2	0.1		10
Columbia	Point	8.6	0.0	8.6	3.4		11
	SUBTOTAL	8.9	0.1	8.8	3.5	5.4	12
Bay Agreement	Nonpoint	219.5	118.8	100.7	40.3		13
Participants	Point	84.5	0.0	84.5	33.8		14
	TOTAL	304.0	118.8	185.2	74.1	229.9	15
Other States in	Nonpoint	35.1	N/A	N/A	N/A	N/A	16
the Watershed	Point	2.8	N/A	N/A	N/A	N/A	17
(NY, WV & DE)	TOTAL	37.9	N/A	N/A	N/A	N/A	18
Watershed Total	Nonpoint	254.6	153.9	100.7	40.3		19
	Point	87.3	2.8	84.5	33.8		20
	TOTAL	341.9	156.7	185.2	74.1	229.9	21
X Axis		A	B	C	D	E	F

Source: 1991 Watershed Model.

1. Allocations recommended by the Reevaluation Workgroup on September 30, 1992.
2. Nonpoint source loads include atmospheric deposition to the land. Point source loads are reported as delivered to tidal waters.
3. 1985 Base Load is 1984-87 averaged output from the Watershed Model plus point source load discharged below fall line.
4. Forest Background Load simulated all land uses converted to forest. (See Technical Appendix Simulation Forest Reference No. 1 and 2A) Includes atmospheric deposition on the land, rivers and lakes estimated to be reducible by 7 million pounds annually through Tier 1 controls under the Clean Air Act.
5. Controllable Load is Base Load minus Forest Background Load.
6. Atmospheric deposition to tidal waters, 34.6 million pounds of nitrogen per year, is not shown on this table. It is estimated that 3.5 million pounds of this total will be reduced by Tier 1 controls under the Clean Air Act.

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Table 2b. Total Phosphorus Loading to Chesapeake Bay by Jurisdiction - 1985 Base Load and Year 2000 Allocation (in millions lbs/yr)

Sept. 30, 1992 Jurisdiction	Nutrient Source[2]	1985 Base Load[3]	Forest Background Load[4]	Controllable Load[5]	Reduction (40% Controllable)	Tributary Nutrient Load Allocation[1]	Y Axis
Pennsylvania	Nonpoint	5.17	0.59	4.58	1.83		1
	Point	1.58	0.00	1.58	0.63		2
	SUBTOTAL	6.75	0.59	6.16	2.46	4.29	3
Maryland	Nonpoint	3.63	0.59	3.04	1.22		4
	Point	2.21	0.00	2.21	0.88		5
	SUBTOTAL	5.84	0.59	5.25	2.10	3.74	6
Virginia	Nonpoint	6.12	1.61	4.51	1.80		7
	Point	5.03	0.00	5.03	2.01		8
	SUBTOTAL	11.15	1.61	9.54	3.82	7.33	9
District of	Nonpoint	0.02	0.002	0.018	0.01		10
Columbia	Point	0.11	0.000	0.110	0.04		11
	SUBTOTAL	0.13	0.002	0.128	0.05	0.08	12
Bay Agreement	Nonpoint	14.94	2.79	12.15	4.86		13
Participants	Point	8.92	0.00	8.92	3.57		14
	TOTAL	23.86	2.79	21.07	8.43	15.44	15
Other States in	Nonpoint	1.56	N/A	N/A	N/A	N/A	16
the Watershed	Point	0.33	N/A	N/A	N/A	N/A	17
(NY, WV & DE)	**TOTAL**	1.89	N/A	N/A	N/A	N/A	18
Watershed Total	Nonpoint	16.50	4.35	12.15	4.86		19
	Point	9.25	0.33	8.92	3.57		20
	TOTAL	25.75	4.68	21.07	8.43	15.44	21
X Axis		A	B	C	D	E	F

Source: 1991 Watershed Model.

1. Allocations recommended by the Reevaluation Workgroup on September 30, 1992.
2. Nonpoint source loads include atmospheric deposition to the land. Point source loads are reported as delivered to tidal waters.
3. 1985 Base Load is 1984-87 averaged output from the Watershed Model plus point source load discharged below fall line.
4. Forest Background Load simulated all land uses converted to forest. (See Technical Appendix Simulation Forest Reference No. 1 and 2A) Includes atmospheric deposition on the land, rivers and lakes that are not assumed to be controlled through Tier I controls under the Clean Air Act.
5. Controllable Load is Base Load minus Forest Background Load.
6. Atmospheric deposition to tidal waters, 1.47 million pounds of phosphorus per year, is not shown on this table. None of this loading will be reduced through Tier I controls under the Clean Air Act.

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Table 3. Nitrogen Loading to the Potomac River Basin

Sept 30, 1992 Potomac River Basin	Nutrient Source[2]	1985 Base Load[3]	Forest Background Load	Controllable Load	Reduction (40% Controllable)	Tributary Nutrient Load Allocation[1]	Y Axis
Pennsylvania	Nonpoint	6.6	4.0	2.6	1.0		1
	Point	0.4	0.0	0.4	0.2		2
	SUBTOTAL	7.0	4.0	3.0	1.2	5.8	3
Maryland	Nonpoint	14.9	7.6	7.3	2.9		4
	Point	8.5	0.0	8.5	3.4		5
	SUBTOTAL	23.4	7.6	15.8	6.3	17.1	6
District of Columbia	Nonpoint	0.3	0.1	0.2	0.1		7
	Point	8.6	0.0	8.6	3.4		8
	SUBTOTAL	8.8	0.1	8.7	3.5	5.3	9
Virginia	Nonpoint	20.8	10.2	10.7	4.3		10
	Point	8.7	0.0	8.7	3.5		11
	SUBTOTAL	29.5	10.2	19.3	7.7	21.8	12
Bay Agreement States Total	Nonpoint	42.6	21.9	20.7	8.3		13
	Point	26.1	0.0	26.1	10.4		14
	TOTAL	68.7	21.9	46.8	18.7	50.0	15
X Axis		A	B	C	D	E	

Table 4. Phosphorus Loading to the Potomac River Basin

Sept 30, 1992 Potomac River Basin	Nutrient Source[2]	1985 Base Load[3]	Forest Background Load	Controllable Load	Reduction (40% Controllable)	Tributary Nutrient Load Allocation[1]	Y Axis
Pennsylvania	Nonpoint	0.66	0.18	0.48	0.19		1
	Point	0.05	0.00	0.05	0.02		2
	SUBTOTAL	0.71	0.18	0.53	0.21	0.50	3
Maryland	Nonpoint	1.36	0.28	1.09	0.43		4
	Point	0.56	0.00	0.56	0.22		5
	SUBTOTAL	1.92	0.28	1.64	0.66	1.26	6
District of Columbia	Nonpoint	0.02	0.00	0.02	0.01		7
	Point	0.11	0.00	0.11	0.04		8
	SUBTOTAL	0.13	0.00	0.13	0.05	0.08	9
Virginia	Nonpoint	2.08	0.60	1.48	0.59		10
	Point	0.49	0.00	0.49	0.20		11
	SUBTOTAL	2.57	0.60	1.97	0.79	1.78	12
Bay Agreement States Total	Nonpoint	4.12	1.05	3.07	1.23		13
	Point	1.20	0.00	1.20	0.48		14
	TOTAL	5.32	1.05	4.27	1.71	3.61	15
X Axis		A	B	C	D	E	

Source: 1991 Watershed Model.

1. This table is preliminary and subject to revision in the Potomac Tributary Strategy.
2. Nonpoint source loads include atmospheric deposition to the land. Point source loads are reported as delivered to tidal waters.
3. 1985 Base Load is 1984-87 averaged output from the watershed model plus point source load discharged below fall line.

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